

ENGINEERING

Regional Supervisor, Branch of Wildlife  
Refuges

April 19, 1962

Acting Regional Engineer

In reply refer to:  
E-Lake Andes  
Water Mgmt.

Lake Andes NWR - 1962 Annual Water Program

We have reviewed the subject program and generally concur in the management of water levels as proposed. Our records show that water levels in Owens Bay may not exceed assumed elevation 6.25 without affecting adjoining roads. Raising water levels to 6.50 should be done only if damage to structural features can be avoided.

We regret that we have not made the necessary surveys to establish the water gauges. This work was scheduled a number of times but could not be done.

We now plan to have engineering personnel at the refuge in about a month to do the necessary survey work and set the permanent staff gauges to sea level datum. Information pertaining to the gauge sections required was furnished with our memorandum to the Wildlife Biologist, Lake Andes, dated October 3, 1960. Services for this work will be charged to job designated R-35-62.

We suggest that gauge readings of water surface levels for each pool be made and reported on assumed datum as has been heretofore done until permanent gauges are set.

The original and one copy of the subject program are returned herewith.

J. R. Wright

Attachments

extra cc: Branch of Refuges  
ELDoeling:rj

Regional Director, Minneapolis, Minnesota

April 12, 1962

Wildlife Biologist, Lake Andes, South Dakota

Water Management Plan, Lake Andes.

Attached is the Annual Water Program for Lake Andes.

The preparation of this Program to include the data requested became something of a major project. Area-capacity data are available only for the North and South Units; therefore, it was necessary to planimeter a topographic map furnished by the Bureau of Reclamation. This map is contoured at the one-foot interval below 1438 m.s.l. and at the five-foot interval above 1439; therefore, it was necessary to interpolate the data required. In the process, a check was made on both the North and South Units and a considerable variation in data appeared. I know there are some differences in the elevations used for base data but as to what extent these affect the data shown in the Program, I do not know. The data shown are tempered by judgement, aerial photos and the knowledge that they are not good.

The inflow to all Units are pure estimates as there are no guaging stations on any of the streams entering Lake Andes.

I am certain this points out the need for established guages on Lake Andes. You will recall that these have been requested from the Branch of Engineering for at least two years now. The Bureau of Reclamation has established bench marks within a mile of each Dike; therefore, setting these guages would not be a major task.

Most of the run-off has occurred at this time. Owens Bay reached 6.8 feet on April 1 and by April 9, had dropped to 6.3 so the additional stoplog was installed on that date. The shoreline looks good and is receiving considerable use by pairs apparently on territory already.

The North Unit was considered to be a danger spot due to the large accumulation of snow on the watershed. Three of the concrete stoplogs were removed from each of the four bays (removal was accomplished with a sledge after a two-ton chain hoist could not budge them) in an effort to prevent the roadway being overtopped. Run-off was gradual; even so, the level reached 101.00 feet. New wooden stoplogs were installed April 10 to the 99.10 level and today, the Unit is at 99.50.

The Center Unit is at 98.60 and spilling into the South Unit which is estimated at 96.35. All water entering Lake Andes is now going into the South Unit and we estimate it will reach the 97.60 level if warm, dry winds do not halt the run-off suddenly.

Harvey W. Miller

WATER MANAGEMENT PROGRAM  
LAKE ANDES NATIONAL WILDLIFE REFUGE

1962

A. Existing Water Supply.

Unit	Gauge Reading	Management Level	Maximum Level	Inflow (approx.)	Outflow (approx.)
North Unit	96.50	99.10	100.00	none	none
Center Unit	94.35	97.60	100.000	none	none
South Unit	93.00	97.60	100.00	500 g.p.m.	none
Owens Bay	5.60	5.50	6.50	800 g.p.m.	500 g.p.m.

The assumed 0.00 gauge reading for Owens Bay is equal to 1435.52 N.S.L.<sup>1/4</sup> and the assumed 100.00 gauge reading for the other Units is equal to 1437.25 N.S.L.<sup>1/4</sup>

B. 1961 Water Uses

The attached table presents the water use data for 1961 in all Units. Area-capacity data are available only for the North and South Units; those presented for the Center Unit and Owens Bay have been calculated from a partial topographic map made in 1959 by the U. S. Bureau of Reclamation and aerial photographs taken in August, 1955.

The management level of the Owens Bay Unit was increased from 4.50 feet to 5.50 feet on April 7, 1961. This increase was designed to restrict the area of river bulrush and other low-value emergents through flooding and to increase the waterfowl breeding territories through flooding back onto the shoreline.

The inflow from the artesian well, approximately 800 g.p.m., and run-off was not sufficient to provide the desired level; it reached 5.00 feet on May 15 and 5.20 on June 19 when evaporative losses exceeded the inflow and the level started receding. However, the increased level obtained did improve the character of the shoreline and 91 breeding pairs were recorded as compared to 71 breeding pairs in 1960. There was no measurable change in the amount of emergents or aquatics in Owens Bay.

The other Units are supplied only by run-off waters. Inflow to these Units was not sufficient to bring them to the management levels; therefore, manipulation of levels was not possible. All these Units which were dry in 1959, produced good stands of aquatic plants. The waterfowl use increased from 162 breeding pairs in 1960 to 249 breeding pairs in 1961.

There were no problems of botulism or other biological factors in 1961.

C. 1962 Management Recommendations.

It is recommended that the level of Owens Bay be increased to 6.30 feet on March 15 or as soon thereafter as the danger of flooding from excessive run-off passes. This level will provide additional exposed shoreline areas for breeding territories and will also flood out some of the dense stands of emergents (mostly river bulrush, cattails and phragmites). The maximum level of 6.50, while desirable for biological purposes, endangers a service roadway to the artesian well especially during periods of temporary increase during rain storms.

The management of the other Units will depend upon the amount of run-off received in the spring. The North Unit, which has the largest watershed, will be allowed to reach the 99.10 level and additional water will be spilled into the Center Unit. If sufficient water is received to fill the Center Unit, it will be maintained at the 97.60 level and additional water will be spilled into the South Unit until it reaches the 97.60 level. If water is being received directly into the South Unit after it reaches the 97.60 level, this water will be held there; however, if water is flowing through the Center Unit into the South Unit, these two Units will be allowed to reach a common level.

Respectfully submitted:

*Harvey W. Miller*  
Harvey W. Miller, Wildlife Biologist

**LAKE ANDERSON NATIONAL WILDLIFE REFUGE**

**1961 Water Use Data**

	North Unit						Center Unit					
	Sp L C M A J											
January	97.20	1434.45	477	1154	95.40	1432.65	1899	8090				
February	97.20	1434.45	477	1154	95.40	1432.65	1899	8090				
March	97.50	1434.75	493	1300	95.60	1432.85	1917	8170				
April	98.00	1435.25	520	1548	95.50	1432.75	1908	8280				
May	97.85	1435.10	512	1475	96.23	1433.48	1973	9700				
June	97.85	1435.10	512	1475	95.50	1432.75	1908	8280				
July	97.44	1434.69	491	1272	95.00	1432.25	1862	7340				
August	97.05	1434.30	468	1080	94.85	1432.10	1849	7050				
September	96.60	1433.85	436	863	94.70	1431.95	1835	6770				
October	96.52	1433.77	430	849	94.68	1431.93	1834	6730				
November	96.50	1433.75	429	840	94.65	1431.90	1831	6670				
December	96.50	1433.75	429	840	94.35	1431.60	1804	6140				
Inflow					500*							
Outflow					none							
											2000*	
											none	

	South Unit						Owens Bay Unit					
	Sp L C M A J											
January	93.15	1430.40	1532	4870	4.50	1440.02	230	665				
February	93.15	1430.40	1532	4870	4.50	1440.02	230	665				
March	93.40	1430.65	1543	5250	4.50	1440.02	230	665				
April	94.00	1431.25	1570	6180	4.70	1440.22	234	715				
May	93.70	1430.95	1556	5710	4.75	1440.27	235	725				
June	93.95	1431.30	1568	6100	5.10	1440.62	245	810				
July	93.40	1430.73	1547	5380	5.10	1440.62	245	810				
August	93.40	1430.65	1543	5220	4.90	1440.42	239	760				
September	93.20	1430.45	1534	4940	5.10	1440.62	245	810				
October	93.11	1430.36	1530	4900	5.30	1440.82	250	860				
November	93.10	1430.35	1529	4890	5.40	1440.92	253	885				
December	93.00	1430.25	1525	4690	5.50	1441.02	255	910				
Inflow					1800*						450*	
outflow					none						150*	

\* Estimated data.

Loke Niles National Wildlife Refuge, South Dakota

Gauge Level Data

	Owens Bay	North Dike (Unit 3)	South Dike (Unit 1)
--	-----------	------------------------	------------------------

O.D. on Gage

Assumed	100.0	100.0	100.0
Elevation(msl)	1435.52	1437.25	<del>1437.25</del>

Bottom of Outlet

Assumed	98.27	92.1	90.6
Elevation(msl)	1435.52	1429.35	<del>1427.85</del>

Crest of Spillway

Assumed	104.27	99.1	97.6
Elevation(msl)	1441.52	1436.35	<del>1434.85</del>
O. O.	1420.0	1420	1420

Top of Dam

Assumed	
Elevation(msl)	

attach to Engg file C p 1